APPENDIX OF PENDING CLAIMS

1. A transducer for converting between mechanical and electrical energy, the transducer comprising:

at least two electrodes; and

a polymer arranged in a manner which causes a portion of the polymer to deflect in response to a change in electric field and/or arranged in a manner which causes a change in electric field in response to deflection of the polymer, wherein the polymer includes an additive.

2. The transducer of claim 1 wherein the additive improves at least one of polymer dielectric breakdown strength, maximum linear strain, dielectric constant, elastic modulus, response time, and actuation voltage.

3. The transducer of claim 1 wherein the additive comprises at least one of a plasticizer, an antioxidant, and a high dielectric constant particulate.

4. The transducer of claim 3 wherein the plasticizer comprises a material selected from a group consisting of high molecular-weight hydrocarbon oil, high molecular-weight hydrocarbon grease, Pentalyne H, Piccovar® AP Hydrocarbon Resins, Admex 760, Plastolein 9720, silicone oil, silicone grease, Floral 105, silicone elastomers, nonionic surfactants, and combinations thereof.

5. The transducer of claim 3 wherein the antioxidant is a nonvolatile solid antioxidant.

6. The transducer of claim 3 wherein the plasticizer reduces the elastic modulus of the polymer and/or increases the dielectric breakdown strength of the polymer.

7. The transducer of claim 1 wherein the additive improves one of the ability of the polymer to convert between mechanical and electrical energy and the adhesion of the polymer.

8. The transducer of claim 1 wherein the polymer is elastically pre-strained.

9. The transducer of claim 1 wherein the transducer is included in an actuator, a generator, and a sensor.

10. The transducer of claim 1 wherein the transducer is included in one of a robot, a motor, a pump, and a toy.

11. A transducer for converting between mechanical and electrical energy, the transducer comprising:

at least two electrodes; and

a polymer arranged in a manner which causes a portion of the polymer to deflect in response to a change in electric field and/or arranged in a manner which causes a change in electric field in response to deflection of the polymer, wherein the polymer comprises a monoethylenically unsaturated monomer homopolymerizable to form a polymer having a glass transition temperature less than about 0 degrees Celsius.

12. The transducer of claim 11 wherein the monoethylenically unsaturated monomer is selected from a group consisting of isooctyl acrylate, 2-ethylhexyl acrylate, decyl acrylate, dodecyl acrylate, hexyl acrylate, isononyl acrylate, isooctyl methacrylate, and 2-ethylhexyl methacrylate.

13. The transducer of claim 12 wherein the monomer contains a halogen.

14. The transducer of claim 13 wherein the halogen is fluorine.

15. The transducer of claim 11 wherein the transducer is included in one of an actuator, a generator, a sensor, a robot, a motor, a pump, and a toy.

16. A transducer for converting between mechanical and electrical energy, the transducer comprising:

at least two electrodes; and

a polymer arranged in a manner which causes a portion of the polymer to deflect in response to a change in electric field and/or arranged in a manner which causes a change in electric field in response to deflection of the polymer, wherein the polymer comprises a thermoplastic elastomer.

17. The transducer of claim 16 wherein the thermoplastic elastomer is styrene-butadiene-styrene block copolymer.

18. The transducer of claim 16 wherein the transducer is included in an actuator, a generator, a sensor, a robot, a motor, a pump, and a toy.

19. A transducer for converting between mechanical and electrical energy, the transducer comprising:

at least two electrodes; and

a polymer arranged in a manner which causes a portion of the polymer to deflect in response to a change in electric field and/or arranged in a manner which causes a change in electric field in response to deflection of the polymer, wherein the polymer comprises silicone and acrylic moieties.

20. The transducer of claim 19 wherein the polymer is a copolymer comprising silicone and acrylic moieties.

21. The transducer of claim 19 wherein the polymer is a polymer blend comprising a silicone elastomer and an acrylic elastomer.

22. The transducer of claim 19 wherein the transducer is included in an actuator, a generator, a sensor, a robot, a motor, a pump, and a toy.

23. A transducer for converting between mechanical and electrical energy, the transducer comprising:

at least two electrodes;

a polymer arranged in a manner which causes a portion of the polymer to deflect in response to a change in electric field and/or to change in electric field in response to deflection; and

a layer laminated to at least a portion of one of the polymer and the at least two electrodes, and mechanically coupled to the polymer and/or one of the at least two electrodes.

24. The transducer of claim 23 wherein the layer is laminated to a portion of a first electrode and provides external mechanical protection to the first electrode.

25. The transducer of claim 24 wherein the transducer has an electromechanical efficiency greater than 80 percent.

26. The transducer of claim 23 wherein the layer distributes load across the polymer more uniformly during deflection.

27. The transducer of claim 23 wherein the layer has a higher stiffness than the polymer.

28. The transducer of claim 23 wherein the at least two electrodes comprises first and second electrodes and the layer is laminated between a portion of the first and second electrodes.

29. The transducer of claim 28 wherein the layer increases breakdown strength of the transducer.

30. The transducer of claim 23 wherein the layer is made from a compatible material relative to the polymer.

31. The transducer of claim 23 wherein the layer is used to compensate for manufacturing defects in the polymer.

32. The transducer of claim 23 wherein the layer provides greater polymer uniformity during deflection.

33. The transducer of claim 23 wherein the layer improves a mechanical property of the transducer.

34. The transducer of claim 23 wherein the layer is an adhesive layer.

35. The transducer of claim 23 wherein the polymer is rolled or folded.

36. The transducer of claim 35 wherein the polymer is folded and the electrodes are patterned.

37. The transducer of claim 35 wherein the at least two electrodes include a grounded outer exposed electrode.

38. A method of fabricating a transducer comprising a polymer comprising an additive and one or more electrodes, the method comprising:

adding an additive to a polymer;

fixing a portion of the polymer to a solid member; and

forming the one or more electrodes on the polymer.

39. The method of claim 38 further comprising pre-straining a first portion of a polymer to form a pre-strained polymer.

40. The method of claim 38 wherein adding the additive to the polymer includes a centrifuge.

41. The method of claim 38 wherein the additive is added to the polymer in a solvent.

42. The method of claim 41 further comprising removing the solvent.

43. The method of claim 38 further comprising spin coating a polymer mixture to produce the polymer.

44. The method of claim 38 wherein the forming one or more electrodes comprises spraying the one or more electrodes onto the pre-strained polymer using a mask.